

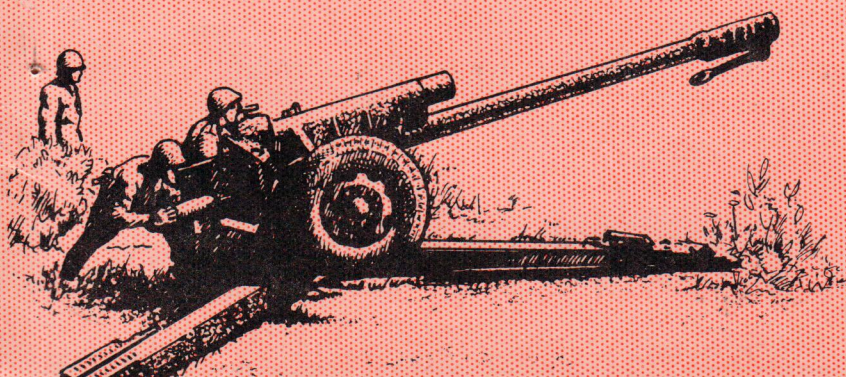
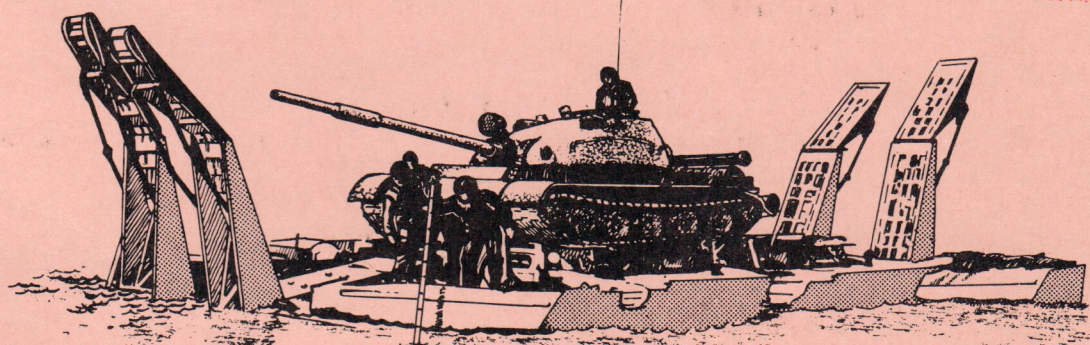
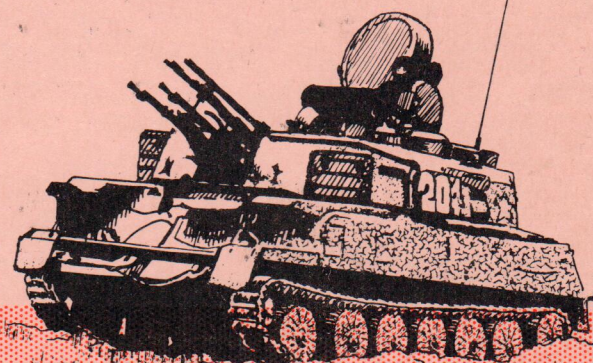
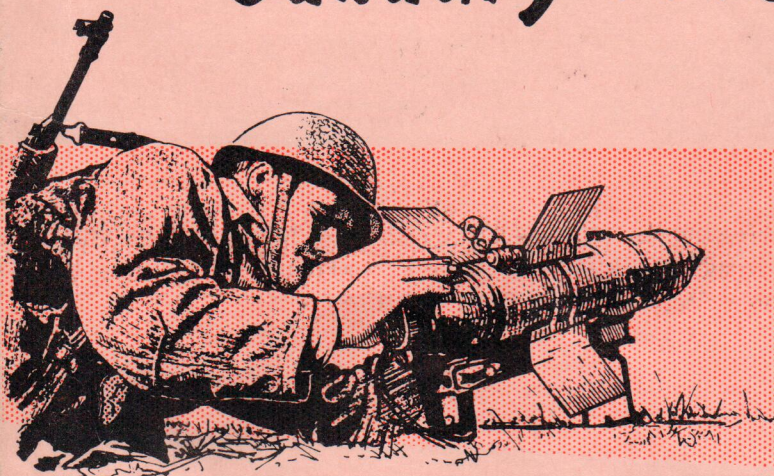
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# **ARMY TECHNICAL INTELLIGENCE REVIEW**

## **SUPPLEMENT- January 1973**



# **№102**

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ARMY TECHNICAL INTELLIGENCE REVIEW No 102 (SECRET)

SUPPLEMENT

JANUARY 1973

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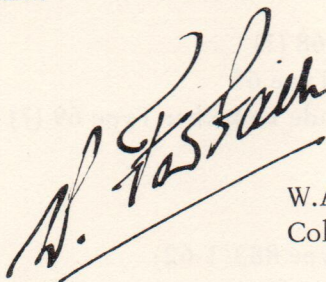
ARMY TECHNICAL INTELLIGENCE REVIEW No 102 (SECRET)

SUPPLEMENT JANUARY 1973

FOREWORD

About eighteen months ago my predecessor referred to the growing importance of China in the Technical Intelligence field. The contents of this issue amply confirm his prediction as we have articles on some Chinese infantry weapons and on two new transceivers as well as the first part of a comprehensive coverage of Chinese AFVs.

The only staff change I have to report concerns myself. It is therefore with some trepidation that I pen these few lines as I only took over from Colonel Stewart Smith in September. He has gone to the Ordnance Board for a very brief stay as by the time this Review is published he will have retired from the Army. We wish him every success in an academic career under far sunnier skies than we normally see in Britain.



W.A.H. FAIRBAIRN  
Col Tech Int(A)

Corrigenda:

Army Technical Intelligence Digest  
Soviet Bloc and Chinese Communist  
Armoured Equipment and Techniques  
Jan 72. Errata.

Page 53 Serials 3 and 5 delete entries in "Internal Features" column.

Page 81 Para 1a, delete 230 mm (7.6 ft) and insert 150 mm (0.5 ft)  
Para 3 - Amend "but it is also thought to have" to  
"but it also has".

Page 82 Amend length of "(19.12 ft)" to read "(18.9 ft)".

- 2 -

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# I.Chinese AFVs -Part I (CONFIDENTIAL Except Fig1)

## Introduction

20 years ago the Communist Chinese had no AFV industry. The few vehicles of this type which they had were either captured from the Chinese Nationalists or given to them by the Soviets. The vehicles captured from the Nationalists were either of Japanese or US origin. They were largely obsolescent when captured and have now completely disappeared from the Chinese Army orbit. The Soviets not only supplied AFVs to the Chinese but also helped them form their AFV industry which has grown so that it now not only supplies AFVs to the Chinese Army but has enabled China to become one of the major exporters of these vehicles in the world.

The map (Figure 1) shows, together with the type of vehicle supplied, the countries which are known to have received Chinese AFVs.

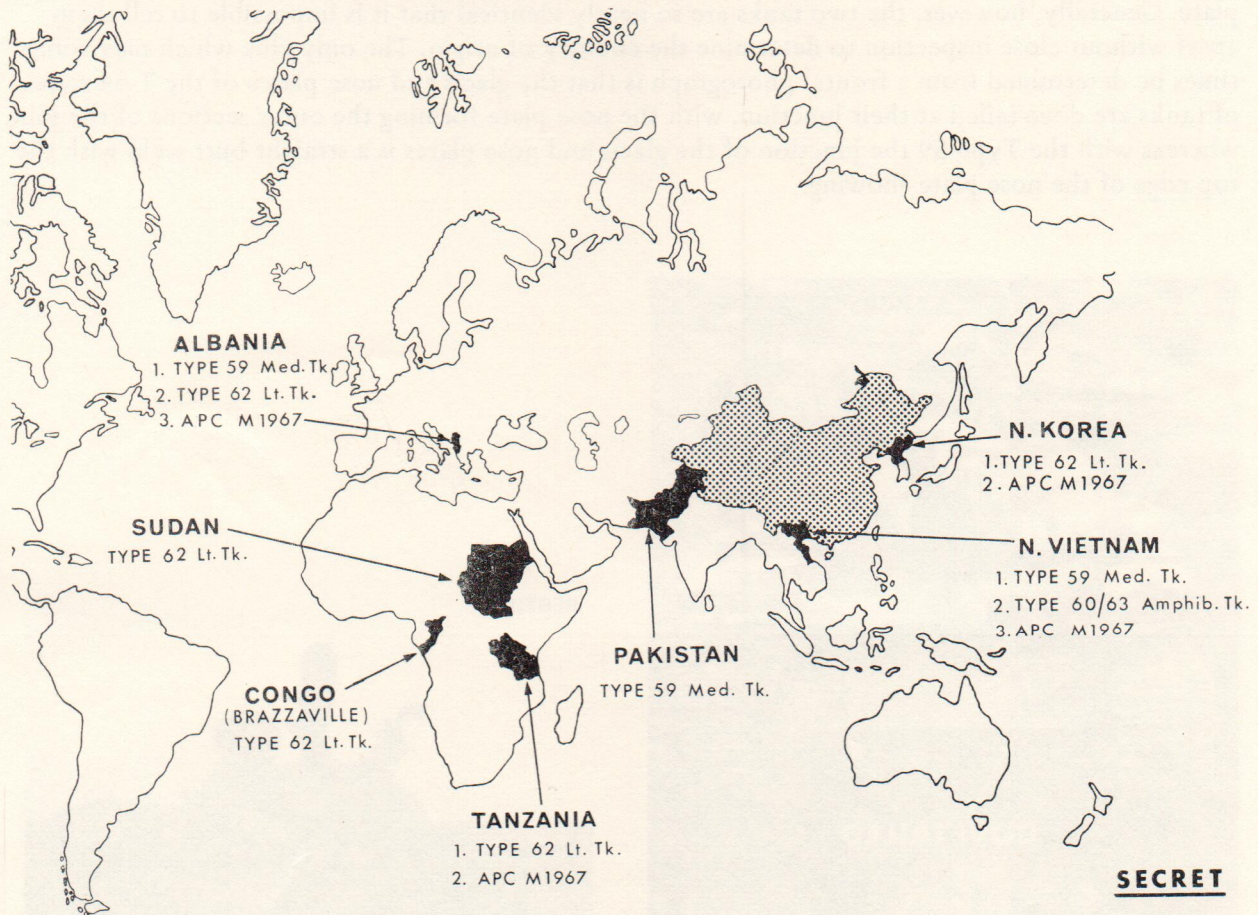


Fig 1. Countries supplied with AFVs by China

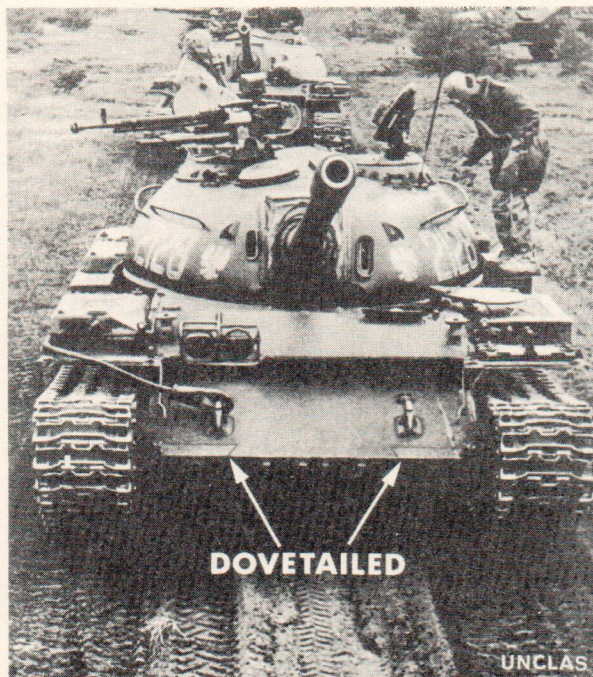
The first Chinese produced AFVs were direct copies of Soviet vehicles but as will be seen later in this article more recent Chinese AFVs are of indigenous general design.



### Medium Tank Type 59

The first home produced tank of the Chinese Army was the medium tank Type 59. This was a direct Chinese copy of the Soviet T-54A medium tank. It was first seen in China in 1959 and the major recipient abroad has been Pakistan who received a large number of these tanks in 1965. The Chinese have also exported this tank to Albania and North Vietnam. The Pakistanis report they like the tank but its recoil vibrations are excessive. This complaint has not been confirmed by the North Vietnamese but they have reported that the tank is difficult and fatiguing to drive for long periods. This is probably because of the relatively small weight and build of the normal Vietnamese. Our assessment of the "driver fatigue factor" is that the tank would be no more tiring or difficult to drive than CENTURION.

Fig. 2 shows the T-54A and Type 59 to be almost identical. When comparing the two tanks allowance must be made for the fact that the Type 59 has been knocked about in its capture. The handrail on the upper right-hand side of the turret is missing as is the wading board across the glacis plate. Generally, however, the two tanks are so nearly identical that it is impossible to tell them apart without close inspection to determine the country of origin. The only clue which may sometimes be determined from a frontal photograph is that the glacis and nose plates of the T-54 series of tanks are dove-tailed at their junction, with the nose plate forming the outer sections of the join, whereas with the Type 59 the junction of the glacis and nose plates is a straight butt weld with the top edge of the nose plate showing.



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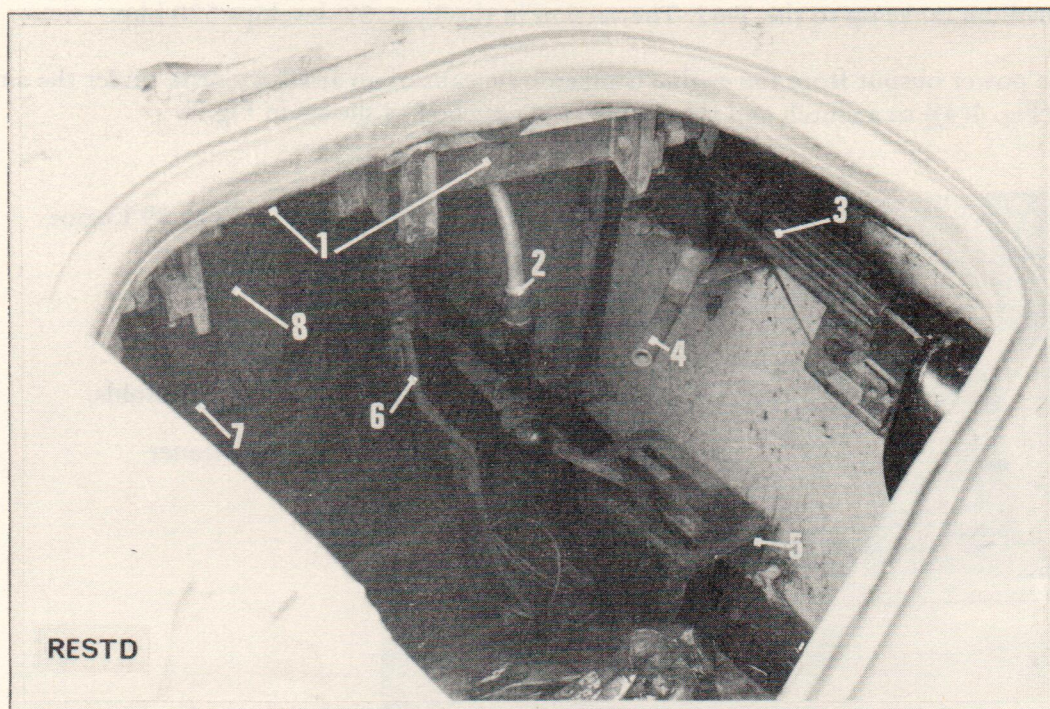


Fig 2. T-54A (left) and Type 59 (right) Tanks — Frontal Views



The main characteristics of the Type 59 tank are the same as those of the T-54A and are given on page 110 of the January 1972 edition of the Army Technical Intelligence Digest – Soviet Bloc and Chinese Communist Armoured Equipment and Techniques. It has now been established that there is no special provision for NBC protection or schnorkelling on this vehicle. These two items are shown as “not known” on page 110 of the above reference.

In the following paragraphs selected points of interest are highlighted.



**Fig 3. Type 59 Driver's Compartment**

**Driver's Compartment.** Fig. 3 is a view through the driver's hatch on the Type 59. The main features that are visible are:

- a. **Periscopes (1).** The housings for the periscopes.
- b. **IR Equipment (2).** The power supply lead for the infra-red driving periscope. This lead has a plastic protective cap over the plug which is inserted into the infra-red periscope. This periscope is exchanged with the left-hand daylight periscope when required. The power supply unit for the infra-red periscope is on the front left-hand wall of the driver's compartment out of sight. It is of interest that on this particular tank this power supply unit was of Soviet manufacture.
- c. **Type 57 7.62 mm MG (3).** (a Chinese copy of the Soviet SGM-T MG). This machine-gun fires through the small hole which is visible on the Type 59 glacis plate in Figure 2. It has no means of elevation or traverse other than that determined by the pitch and yaw of the tank hull.
- d. **MG cocking handle (4).**
- e. **Gear change lever gate (5).** The arrangement of the gate is rather inconvenient for the driver. The top three positions are from left to right: third, reverse and fourth gear, the bottom three positions from left to right are: second, first and fifth gear.
- f. **Right-hand steering lever (6).**



g. **Foot brake pedal (7).** There is an arrangement for this to be secured in the "on" position for parking instead of a hand brake.

h. **Accelerator pedal (8).**

**Engine and Transmission.** The engine on the Type 59 is mounted transversely in the hull as it is on the T-54, T-55 and T-62 tank series. The actual engine installation in a Type 59 is shown in Figure 4. It is a development of the same V-12 water cooled diesel engine as was used in the Soviet T-34 tank and which, with outputs varying from 500 to 580 bhp, has been used in all subsequent Soviet medium tanks up to the T-62. The version in the Type 59 develops 520 bhp.

The power output from the engine is taken by means of an auxiliary drive under the air cleaner (Fig. 4(4)) to a clutch and thence into the gear box as shown in Fig. 5.

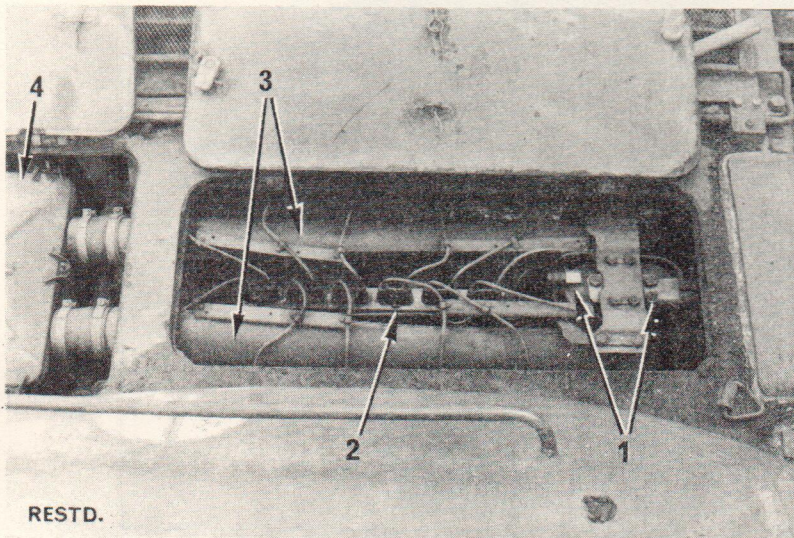
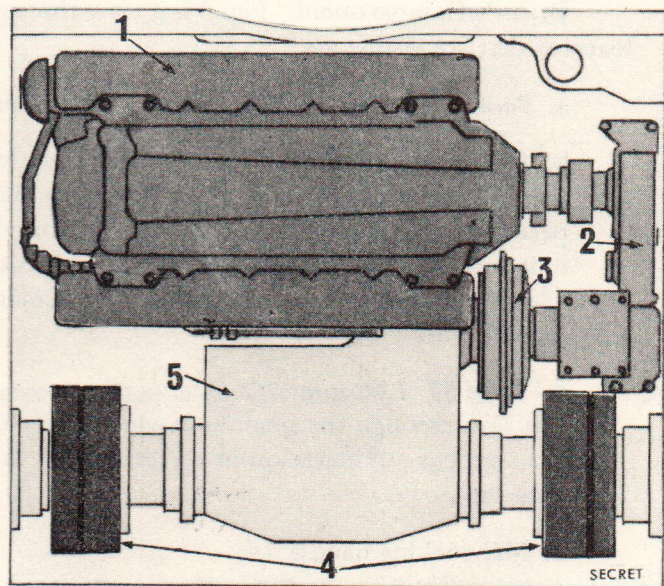


Fig 4. Type 59 Engine

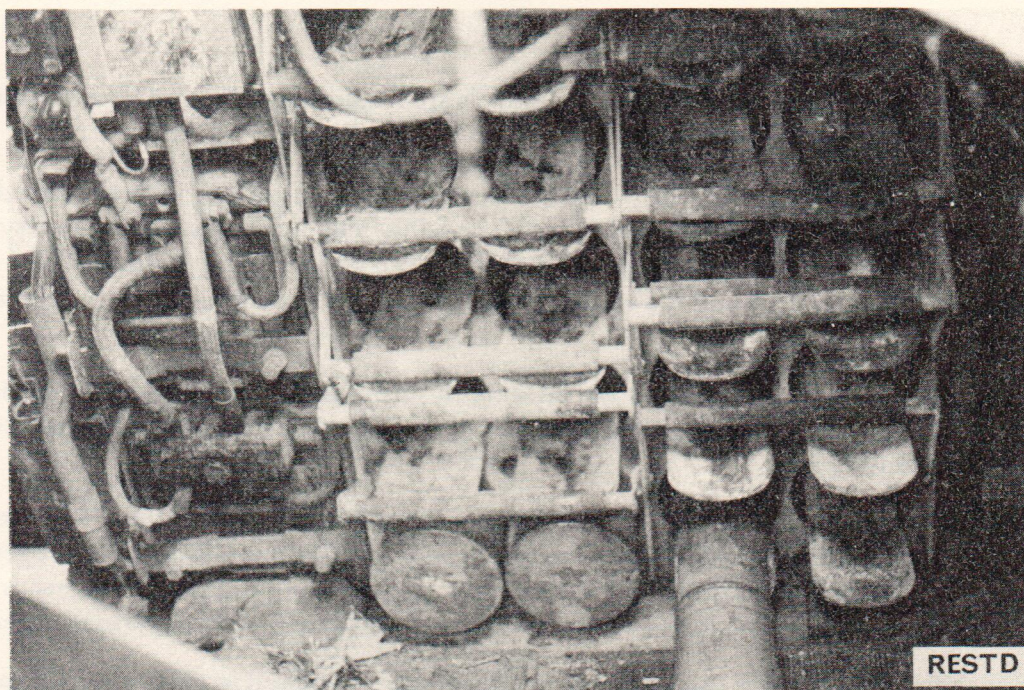
- (1) Fuel filters.
- (2) Fuel pump.
- (3) Inlet manifolds.
- (4) Air cleaner

Fig 5. General Layout of the Engine and Transmission of the Soviet Medium Tanks T-54 to T-62 Series and Chinese Medium Tank Type 59.

- (1) Engine
- (2) Auxiliary drive.
- (3) Clutch.
- (4) Steering and braking units.
- (5) Gear box.







**Fig6. 20 Round Ammunition Rack**

**Ammunition Stowage.** Like the T-54 tank the Type 59 carries 34 rounds of 100 mm ammunition. These are distributed in the vehicle as follows:

- a. 20 rounds are carried in racks in the right forward part of the hull. Between these racks and the front of the tank are fuel tanks and to the left of the racks, as can be seen in Fig 6, are the batteries. The racks have no protection so that the rounds are vulnerable to spill and there is the added hazard of the loader "shorting" one of them against the battery terminals. This would probably result in the round exploding killing the loader as it did in a British CENTURION a few years ago. In this instance though the "short" occurred because the battery cover was missing.
- b. 4 rounds on the right-hand hull wall in the fighting compartment to the rear of the 20 round rack described above.
- c. 1 round on the engine bulkhead.
- d. 2 rounds on the left-hand hull wall of the fighting compartment.
- e. 5 rounds in the centre of the turret bustle.
- f. 2 rounds on the right rear wall of the turret. It is worth noting in connection with the 7 rounds stowed in the turret that UK and US practice has been to avoid stowing main armament cartridges above the turret ring because of the hazard this raises.

**Loading Problems.** Although seven of the 100 mm rounds are stowed conveniently for loading in the turret their weight and size make them very cumbersome and precludes rapid re-loading. Depending on its nature the complete 100 mm round is between 0.91 m and 1.07 m in length and weighs, on average, 30 kg. Apart from the weight these rounds are very difficult to balance being nose heavy. The AP projectiles for instance weigh about 16 kg ie over 50% of the total round weight. By comparison the UK 105 mm APDS round, with an overall length of 0.84 m has a projectile of only 6.4 kg out of a total weight of 19 kg. Even the 105 mm HESH round is only 2 kg heavier than the APDS.



**Gunner's Controls.** Some of the gunner's controls are illustrated in Fig 7. The main points of interest are:

- a. **Traverse Indicator (1).** This consists of a scale on the turret ring with numbered divisions every hundred mils (the Soviets and Chinese use 6,000 mils =  $360^\circ$ ) and marks every 10 mils. The smaller scale, with its illuminating light, which can be seen in the bottom left of Fig 7 is marked from zero to 9 and is a vernier scale enabling the gunner to lay to an accuracy of 1 mil.
- b. **Traverse Hand Wheel (2).** As can be seen, this hand wheel is rotated in the vertical plane contrary to the general accepted ergonomic practice of having traverse hand wheels rotating in the horizontal plane.
- c. **Powered Laying Controller (3).** Elevation hand grips are provided on either side of the box-like powered laying control unit. On top of each hand grip is a firing button operated by the thumb. The two hand grips are rotated in the vertical plane and power traverse is obtained by rotating the whole unit in the horizontal plane in the direction of traverse required.
- d. **Stabiliser Refill Tank (4).** The turret armament is stabilised in elevation by means of an electro-hydraulic system. The filler tank for the hydraulic part of the system is attached to the turret roof.

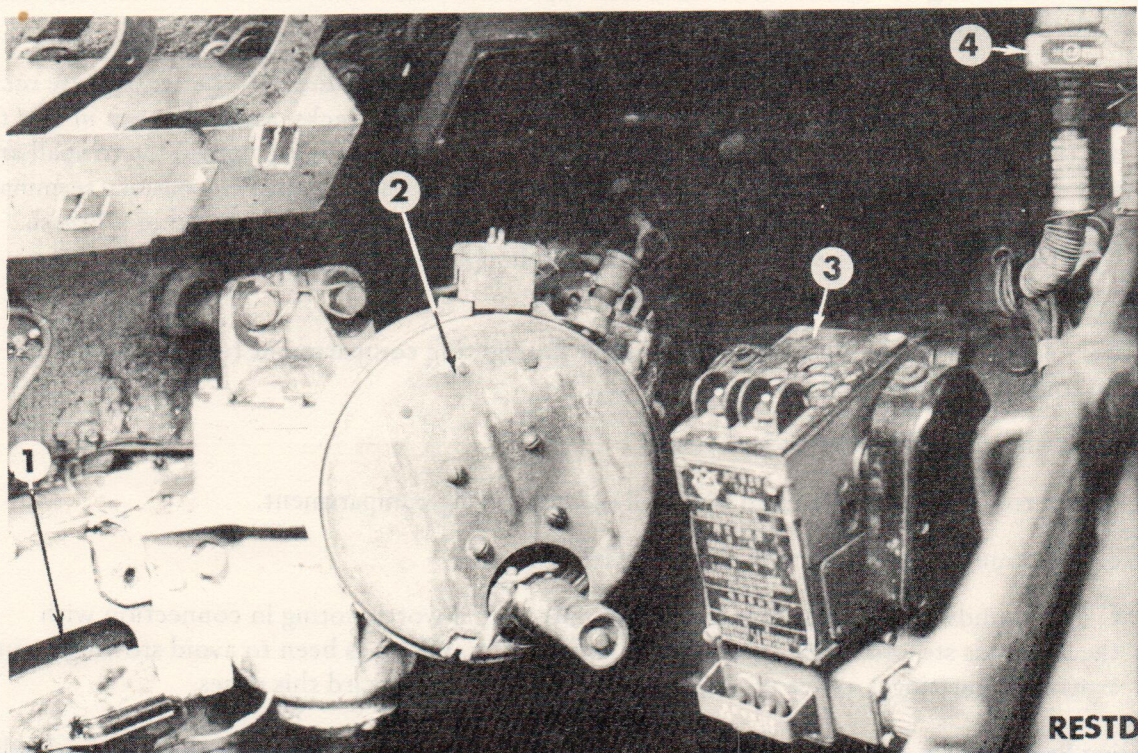


Fig 7. Type 59 Tank Gunner's Controls



**Escape Hatch.** An escape hatch (Fig. 8) is situated in the floor of the fighting compartment on the left-hand side. This hatch opens inwards and is secured by 4 catches. The practice of providing escape hatches in the floor of Western vehicles was discontinued as a result of experience in World War II where it was found these were a considerable hazard to crews when mines were detonated under the track. As the side of the Type 59 is vertical and not sloped as it is in British and US tanks the escape hatch of the Type 59 would be particularly vulnerable to this form of attack. Furthermore it opens inwards and is directly below the commander and/or gunner when the gun is in the fighting arc of 10 to 2 o'clock making it particularly dangerous to them.

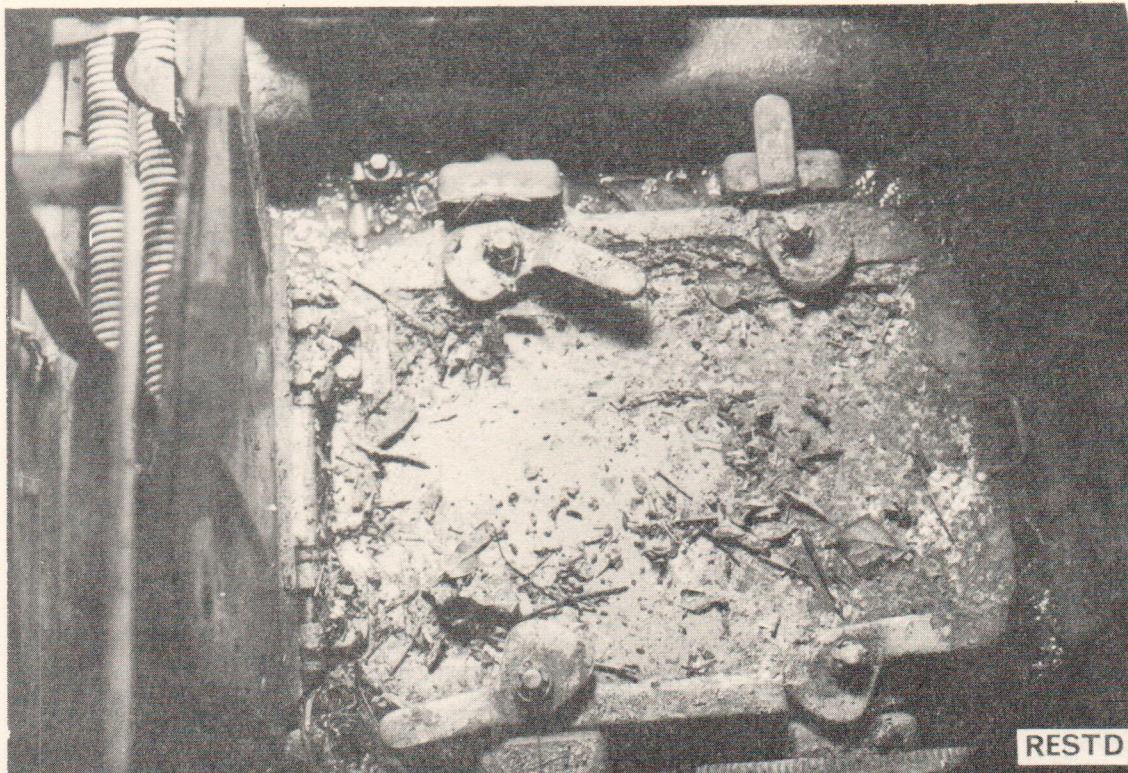


Fig 8. Type 59 Tank – Escape Hatch

**Shortcomings.** By today's standards the Type 59 is a very simple tank. Its strong points are its design simplicity and reliability in service. Its major disadvantages, which it shares with the T-54A, are:

- a. Lack of any night fighting capability other than the driver's infra-red viewer.
- b. The poor and unprotected ammunition stowage arrangements.
- c. A carriage of approximately 1/3rd the total fuel capacity of 810 litres in unprotected fuel tanks mounted on the right-hand track guard.
- d. Poor human engineering design.

Information on other Chinese AFVs will be continued in the next SECRET edition of the review.



large hatch (Fig. 2) is situated in the floor of the fighting compartment on the left hand side. This hatch opens upwards and is secured by 4 cross bars. The purpose of providing escape hatches in the floor of Western vehicles was demonstrated as a result of experience in World War II. When it was found there were a considerable number of cases where men were detained under the hatches of the side of the Type 59, a vehicle was not shown as it is in British and US tanks the escape hatches of the Type 59 would be particularly vulnerable to the form of attack. Furthermore it opens upwards and is directly below the commander and/or driver when the gun is in the fighting position. It is a fact, making it particularly dangerous to them.

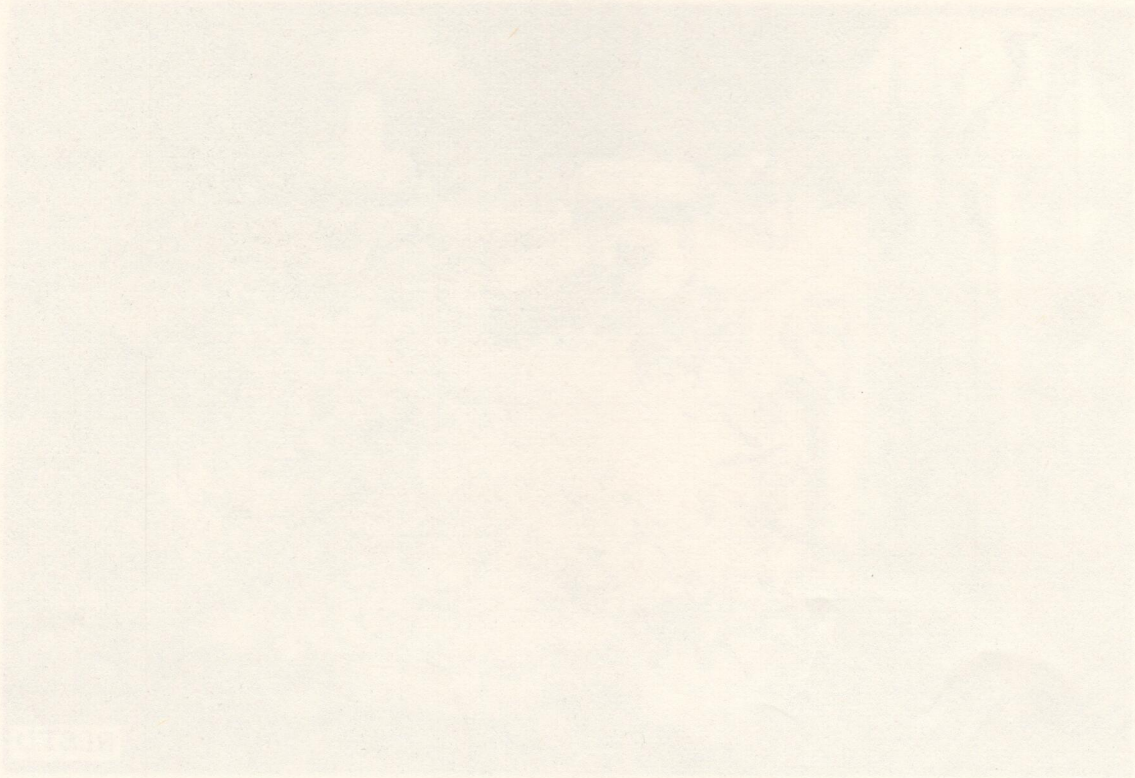


Fig. 2. Type 59 Tank - Large Hatch

It should be noted that the Type 59 is a very simple tank in design and is not a modern tank. It is a very simple tank in design and is not a modern tank. It is a very simple tank in design and is not a modern tank.

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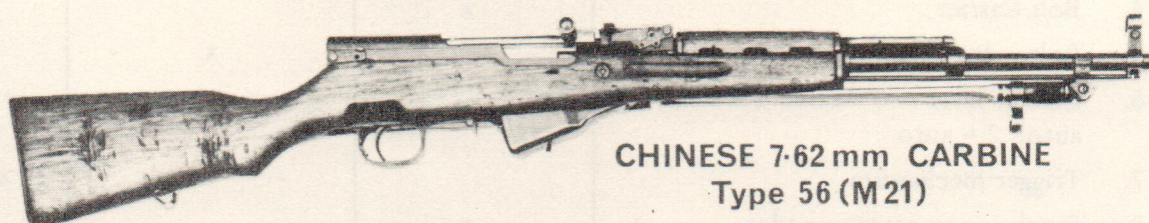


## 2. Spoils from Vietnam... ..

### Infantry Weapons (CONFIDENTIAL)

The conflict in South Vietnam has long been a "shop window" with respect to the Chinese arms industry and 1972 has been no exception. For the infantry, there were three major "finds" resulting from the North Vietnamese thrust across the Demilitarised Zone in early April 1972. The most interesting of these was the appearance of the new Chinese carbine – the 7.62 mm Carbine Type 68(?). Its existence was known for several years but it had not been sighted until this thrust occurred. At the same time, there appeared two Chinese produced anti-tank weapons – the 82 mm Recoilless Gun Type 65 and the 40 mm Anti-tank Grenade Launcher Type 69 (?).

#### 7.62 mm CARBINE TYPE 68 (?)



CHINESE 7.62 mm CARBINE  
Type 56 (M21)



CHINESE 7.62 mm CARBINE  
Type 68(?)



CHINESE 7.62 mm ASSAULT RIFLE  
Type 56

CONFIDENTIAL

Fig 1. Chinese Carbines and Assault Rifle

This weapon is not a direct copy of any Soviet or Western weapon but incorporates some features of the Chinese copies of the Soviet 7.62 mm Carbine SKS and 7.62 mm Assault Rifle AK-47, as well as features which are new to the Chinese industry (Fig 1). This is probably best illustrated by the table on page 12.



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FEATURE	SKS (TYPE 56)	AK-47 (TYPE 56)	NEW
1. Gas operation	x	x	
2. Piston — short stroke “tappet”	x		
3. Gas adjustment — 2 position			x
4. Bolt Carrier	x		
5. Bolt — Rotating lock		x	
6. Change lever — 0 = safe; 1 = semi-auto; 2 = auto.			x
7. Trigger mechanism			x
8. Stock — one piece, wooden	x		
9. Upper hand guard — plastic			x
10. Bayonet — triangular prong	x	x	
11. Magazine — 20 round			x

Other pertinent characteristics are:

Overall length	1.034 m	(40.75 in)
Barrel length	0.52 m	(20.5 in)
Weight unloaded	3.98 kg	(8.75 lb)
Effective range	400 m	(440 yd)
Muzzle velocity	735 m/sec	(2,410 ft/sec)
Ammunition	7.62 x 39 mm	

This appearance in South Vietnam preceded the first confirmed sighting in China by some seven months, but it is now known to be in service with the Chinese Army.



### 82 mm RECOILLESS GUN TYPE 65

This weapon is thought to be the Chinese version of the Soviet 82 mm Recoilless Gun B-10 though it is not a direct copy (Fig 2). It is a smooth bore, breech loaded, direct or indirect fire weapon. It is tripod mounted and can be separated from the tripod to be man-packed. Sighting is facilitated by either the mechanical or optical sights. Known technical details are:

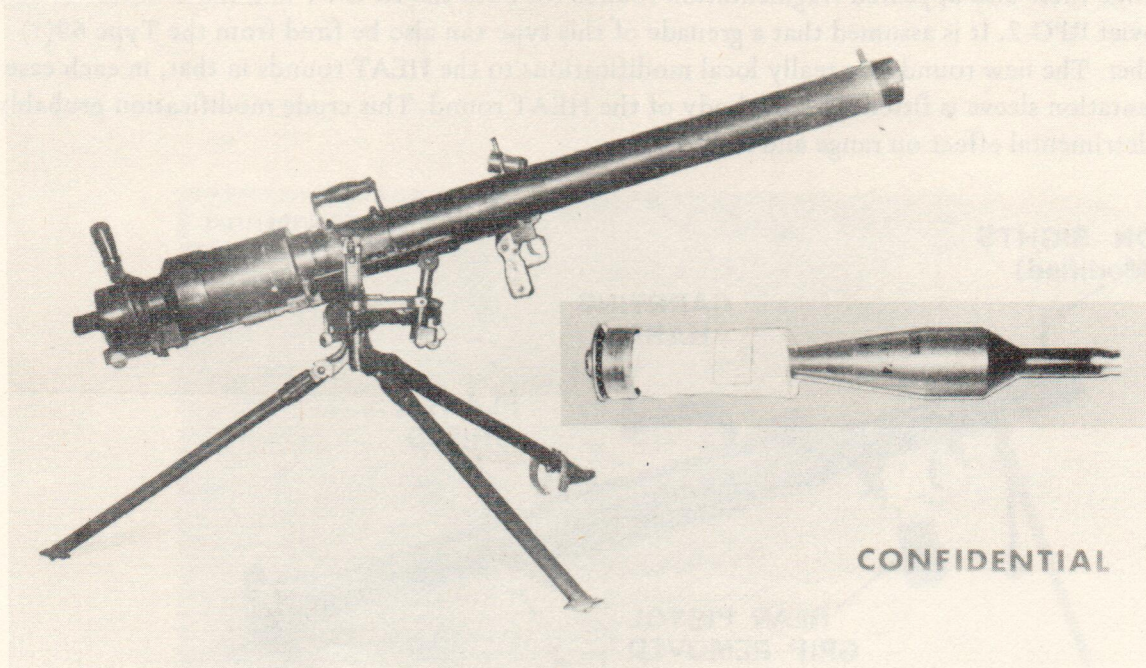


Fig 2. Chinese 82 mm Recoilless Gun Type 65

#### Weapon

Overall length	1.74 m	(68.5 in)
Weight in combat position	29.2 kg	(64 lb)
Rate of fire	5-6 rpm	
Maximum horizontal range	4000 m	(4400 yd) (estimate)
Effective range	400 m	(440 yd) (estimate)
Armour penetration at 0°	229 mm	(9 in) (estimate)

#### Ammunition

Type	HEAT	
Length	581.5 mm	(22.9 in)
Weight	3.42 kg	(7.13 lb)
Fuse	Point Initiating Base Detonating (PIBD)	



#### 40 mm ANTI-TANK GRENADE LAUNCHER TYPE 69 (?)

The renewed vigour of the war in 1972 brought to light the first samples of the Chinese version of the Soviet RPG-7V. Though the weapon is basically the same as the Soviet model, some modifications have been effected. The more obvious of these are indicated in Fig 3. Details of characteristics and performance are expected to be similar to those of the RPG-7V (ATIR 99-April 1971). At the same time there also appeared fragmentation rounds for both the RPG-7V and the Chinese version of the Soviet RPG-2. It is assumed that a grenade of this type can also be fired from the Type 69(?) Launcher. The new rounds are really local modifications to the HEAT rounds in that, in each case a fragmentation sleeve is fitted over the body of the HEAT round. This crude modification probably has a detrimental effect on range and stability.



Fig 3. Comparison Chinese Type 69 (?) and Soviet RPG-7V



### 3. New Chinese Transceivers (CONFIDENTIAL)

#### INTRODUCTION

Recent modernisation of Chinese military equipment is evidenced by the appearance of two radio sets of their own design and manufacture. Earlier Chinese radios were either of foreign manufacture and design or copies of these radios of their own manufacture.

#### Chinese VHF/FM Transceiver Type 883 (T-62)

The type 883 (Fig 1) radio set is frequency modulated and operates in the VHF frequency range. It is a light weight, manpack, short range set used at section, platoon, and possibly company level. Components include both subminiature electronic tubes of good quality and solid state devices (diodes and transistors). It is powered by four 1.5V batteries and one "B" battery pack type D-62 providing outputs of 15V, 82.5V and 150V. Battery life is considered to be about 20 hours with a receive to transmit ratio of 9.1. The power output is about 0.5 watt with a range of approximately 1.5 miles.

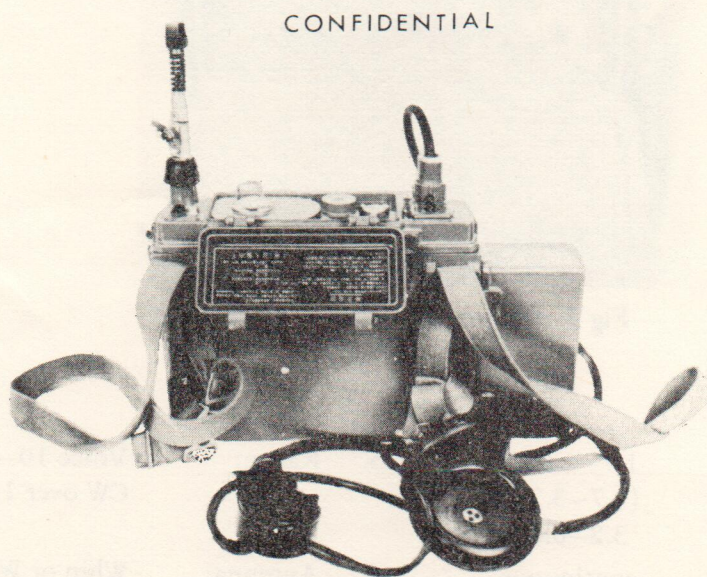


Fig 1. Chinese Transceiver Type 883 (T-62)

#### Technical Characteristics

- |                        |            |   |   |
|------------------------|------------|---|---|
| 1. Frequency Range:    | 45-50 MHz  | 5. Range                                    | Up to 2.5 km (1.5 miles)  |
| 2. Type of tuning:     | continuous | 6. Antenna:                                 | Kulikov type  |
| 3. Type of modulation: | FM/Voice   | 7. Weight with<br>accessories &<br>battery: | 6 kg (13 <sup>3</sup> / <sub>4</sub> lb)  |
| 4. Power output:       | 0.5W       | 8. Dimensions:                              | Height - 21.6 cm (8 <sup>1</sup> / <sub>2</sub> in)<br>Width - 33.0 cm (13 in)<br>Depth - 7.4 cm (2 <sup>7</sup> / <sub>8</sub> in) |



### Chinese HF Transceiver Type 251A (Type 01)

The 251A (Fig 2) is a light weight, manpack, fully transistorised HF radio set capable of voice and CW operation. It operates on two frequency bands covering a range of 1.7 to 6.0 MHz. The radio set is continuously tuned and calibrated by the operator. The receiver and transmitter are separate allowing transmit and receive on different frequencies using either a whip antenna or two separate wire antenna. The set is powered by two 12V dry batteries connected in series to provide a 24 volt power supply. A 1.5V cell is used to provide power for the dial lights. .

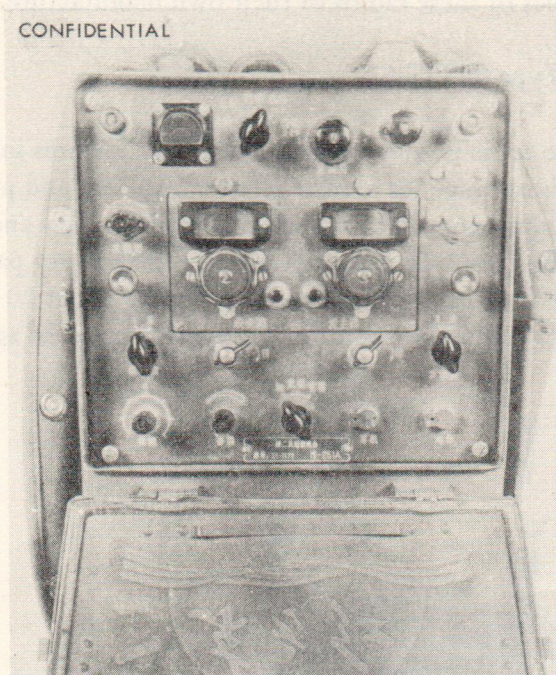


Fig 2. Chinese Transceiver Type 251A

#### Technical Characteristics

- |                        |  |                            |  |
|------------------------|--|----------------------------|--|
| 1. Frequency Range:    | 1.7-6.0 MHz<br>(1.7-3.2 MHz,<br>3.2-6.0 MHz) | 5. Range:                  | Voice 10-15 km (7-10 miles)<br>CW over 160 km (100 miles)                      |
| 2. Type of tuning:     | continuous                                   | 6. Antenna:                | Whip or Wire   |
| 3. Type of Modulation: | AM   | 7. Weight with<br>battery: | 7kg (15 lb)  |
| 4. Power output:       | Voice 2W<br>CW 3.5W                          | 8. Dimensions:             | Height - 22.9 cm (9 in)<br>Width - 33.7 cm (13¼ in)<br>Depth - 10.8 cm (4¼ in) |



## 4. New Soviet Engineer Tractor (CONFIDENTIAL)

What we believe to be a new Soviet Engineer Tractor (Fig 1) was sighted in East Germany in August 1972. The chassis appears to be the hull of a T-54 Medium Tank and the hydraulic bulldozer blade, which we think can be adjusted for push-up, straight, angled or V-configuration, is similar in appearance to those on the BAT-M (ATIR No 94) and PKT (ATIR No 102). A small armoured cupola gives the driver/operator good visibility. In place of the tank turret is an armoured hydraulic crane with an armoured operator's position. What appears to be a grab is fitted to the end of the crane boom and an attachment bucket can be seen above the left hand track. There is no indication of schnorkelling equipment.

We consider this machine to be a useful addition to the Soviet engineer inventory, either complementing or supplementing the widely used engineer tractor BAT-M, enabling him to operate under armour in forward areas. The crane will be especially useful in route clearing and in preparing exits along steep river banks, although the apparent lack of a schnorkel means that either GSP or PMP ferries would be required to cross rivers deeper than about 1.2 metres.

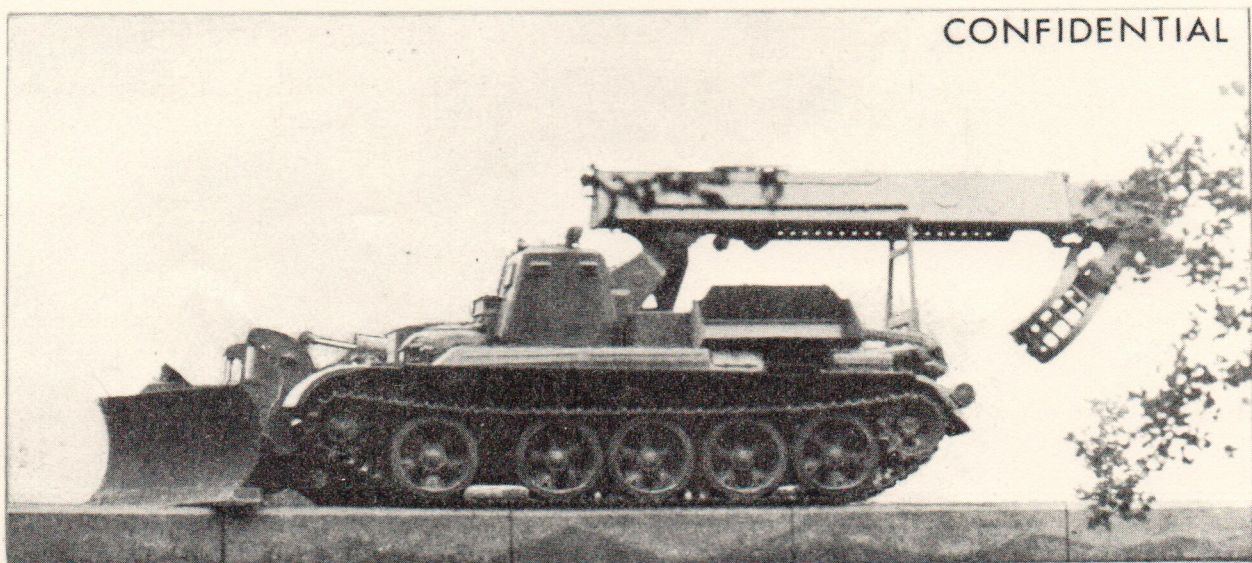


Fig 1. Engineer Tractor M-1972

Note: Since going to press the nomenclature of this equipment has been changed to ARMoured ENGINEER TRACTOR M-1972.



# A New Soviet Engineer Tractor (CONFIDENTIAL)

What we believe to be a new Soviet Engineer Tractor (Fig 1) was sighted in East Germany in August 1972. The chassis appears to be the hull of a T-54 Medium Tank and the hydraulic bellows tank, which we think can be adjusted for push or straight, angled or V configuration, is similar to those on the BAT-M (ATR No 94) and PAT (ATR No 102). A small mounted hydraulic crane gives the tractor good visibility. In place of the tank turret is an armoured hydraulic crane with an armoured operator's position. What appears to be a grab is fitted to the end of the crane boom and an attachment bracket can be seen above the left hand track. There is no indication of a rear wheel drive.

We consider this machine to be a modification to the Soviet engineer tractor, either by substituting or supplementing the widely used engine tractor BAT-M, enabling it to operate under almost all terrain conditions. The crane will be especially useful in route clearing and in preparing roads along river banks, although the apparent lack of a standard means that either GSP or TMT tractors would be required to cross rivers deeper than about 1.2 metres.

CONFIDENTIAL



Fig 1. Engineer Tractor M-102

Block going to place the nose of the tractor in the position of the engine has been changed to  
ARMOURING ENGINEER TRACTOR M-102



## 5. 100mm Anti-Tank Gun T-12A (SECRET AUSCANUKUS)

In July 1971 a major modification was seen on the 100 mm anti-tank gun T-12 (Fig 1). The evident change at that time was the introduction of a third cylinder, above and to the right of the two recoil cylinders.

The East Berlin May Day Parade provided another opportunity to see the modified gun, this time in greater detail (Fig 2). It was confirmed then that the third cylinder was a closed one with probably a balancing function, as the existing balancing system which was below and to the rear of the shield, appeared to have been removed. Other changes in the diameter and width of the tyres and in the barrel jacket also were noticed then. At this time it was agreed that the modified gun would be called 100 mm anti-tank gun T-12A.

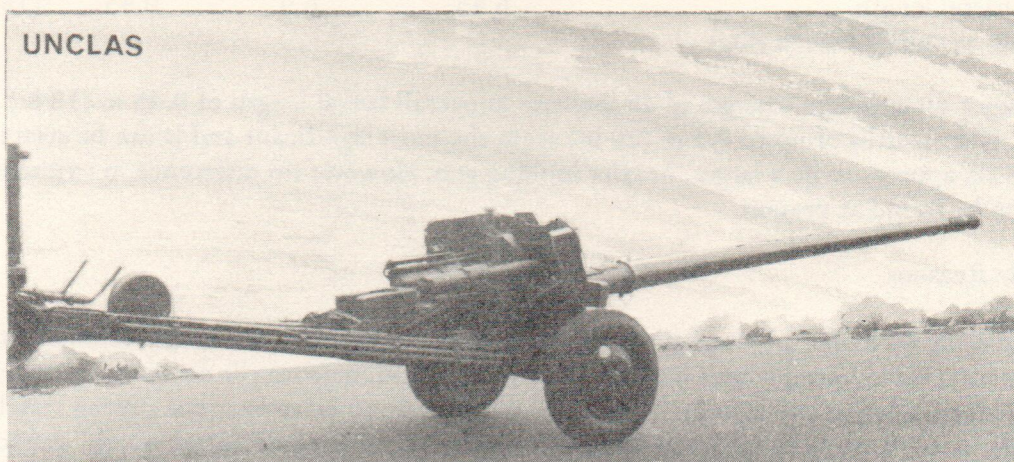


Fig 1. 100 mm Anti-Tank Gun T-12

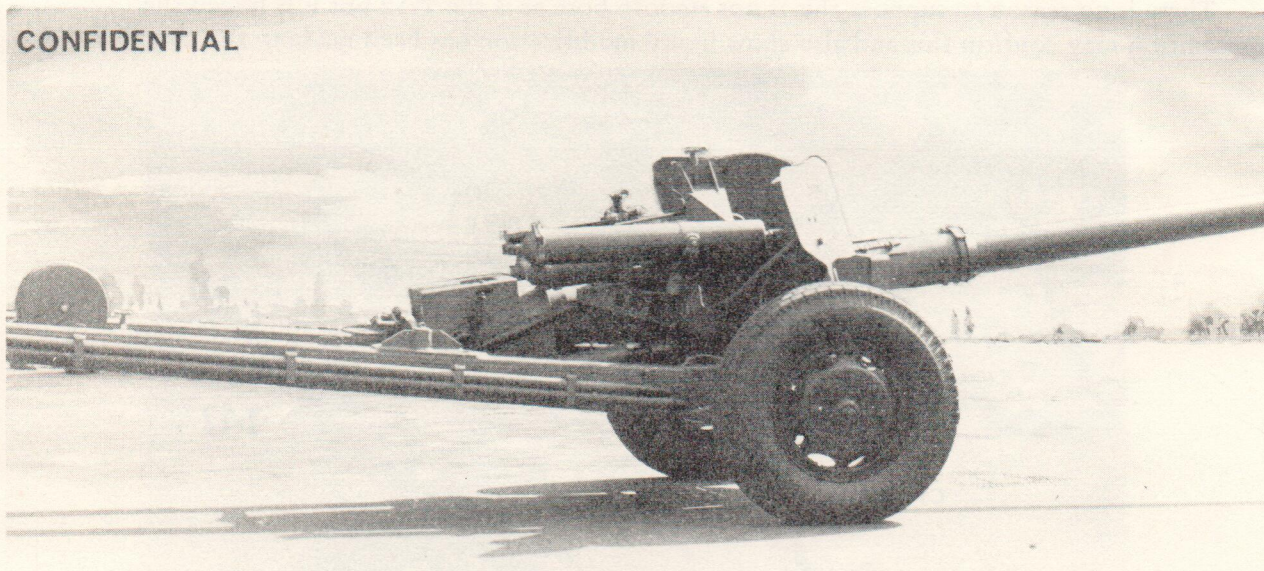


Fig 2. 100 mm Anti-Tank Gun T-12A

Later photography (Fig 3) has shown so many other modifications and dimensional changes that the T-12A may well be an entirely new gun.



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The dimensional differences between the original T-12 and the T-12A apparent from photography are listed below for ease of reference:

	Original T-12	T-12A	Differences
Overall width	1.785 m	2.26 m	0.475 m (18¾ in)
Width inside wheels	1.36	1.80	0.44 (17¼ in)
Width top of shield	1.70	2.22	0.52 (20½ in)
Width bottom of shield	0.975	1.46	0.485 (19 in)
Tyre diameter	0.89	1.02	0.13 (5 in)
Tyre width	0.206	0.23	0.024 (0.9 in)
Distance muzzle to shield (on centre line of barrel)	4.75	4.5	0.25 (10 in)
Total barrel length (Muzzle to end of breech ring)	6.45	6.9	0.45 (18 in)

The major dimensional changes of an increase in overall barrel length of 0.45 m (18 in) and in overall and other widths of up to 0.5 m (20 in) seem the most significant and it can be seen in figure 3 that the T-12A appears to be a larger, heavier looking gun. However no difference in external barrel diameter can be found at present.

#### The Possible Reasons

It is difficult with only photography to be sure of the reasons for the modifications but it is possible the increase in barrel length has been made to try and improve the accuracy at direct fire at the longer ranges, whereas the increase in width is more likely to be to improve towing stability. The third cylinder could have been found necessary because of the increased barrel length, and to provide a more efficient balancing system for what must be a 'muzzle heavy' gun, than that previously held.

There is no reason to suppose this is not smooth bore as is the T-12 but it is hoped the ammunition may confirm this and also show if any modification has been made to the chamber.

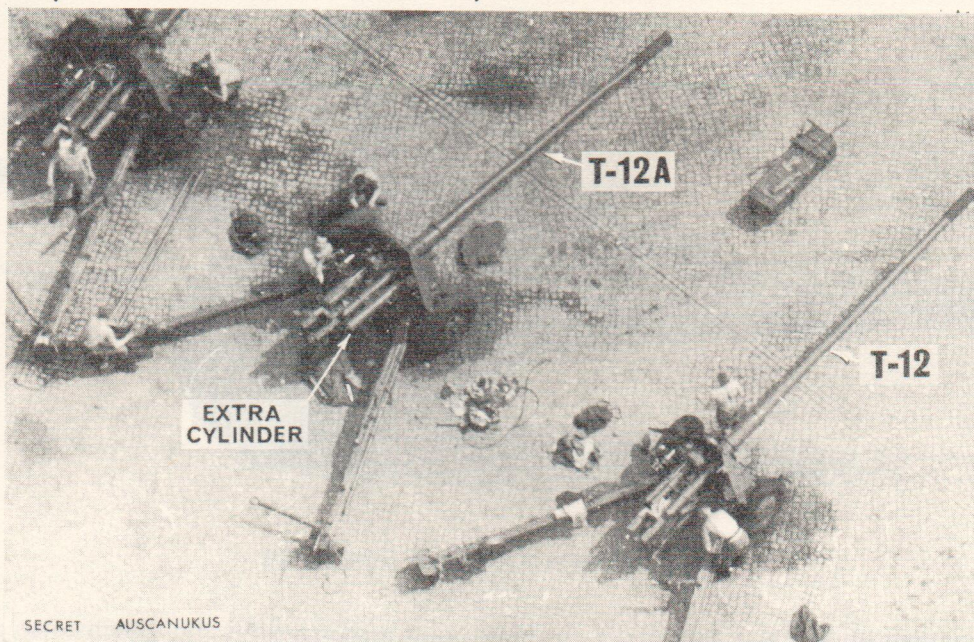


Fig 3. T-12 and T-12A Anti-Tank Guns



## 6. The Soviet ARS-14 NBC Decontamination Bowser (SECRET AUSCANUKUS)

### Background

The first article in Army Technical Intelligence Review Supplement No 101, published in July 1972, described in some detail an apparent new version of the ARS-12 NBC Decontamination Bowser mounted on ZIL-131 chassis, and highlighted the several differences between this equipment and the older ARS-12D (mounted on ZIL-151) and ARS-12U (ZIL-157). The article also provisionally identified the equipment as ARS-12M.

At about the same time an article published in the East German magazine "Militärtechnik" referred to this new equipment as ARS-14, which is shortly due to enter service with the East German Army, and went into quite considerable detail as to its various roles and functions. In passing, it confirmed our theory expressed in Review Supplement No 101 that the decontamination hoses are now stored in the left hand rear stowage compartment rather than the right hand rear bin as is the case in both ARS-12 Models.

A synopsis of the contents of the East German article follows, together with several new photographs and descriptive line diagrams of ARS-14.

### Role and Functions of ARS-14



Fig 1. Aerial view of the ARS-14 NBC Decontamination Bowser on ZIL-131, 6 x 6 Cross Country Truck Chassis.

The primary functions of ARS-14 are:

- a. Deactivation, decontamination and disinfection of vehicles and equipment.
- b. Decontamination and disinfection of roads and terrain.
- c. As a normal Bowser vehicle in the transportation of liquids.
- d. Fire Fighting.

It can also be used, as could the two ARS-12 models, for contaminating the ground by spraying with toxic chemicals.

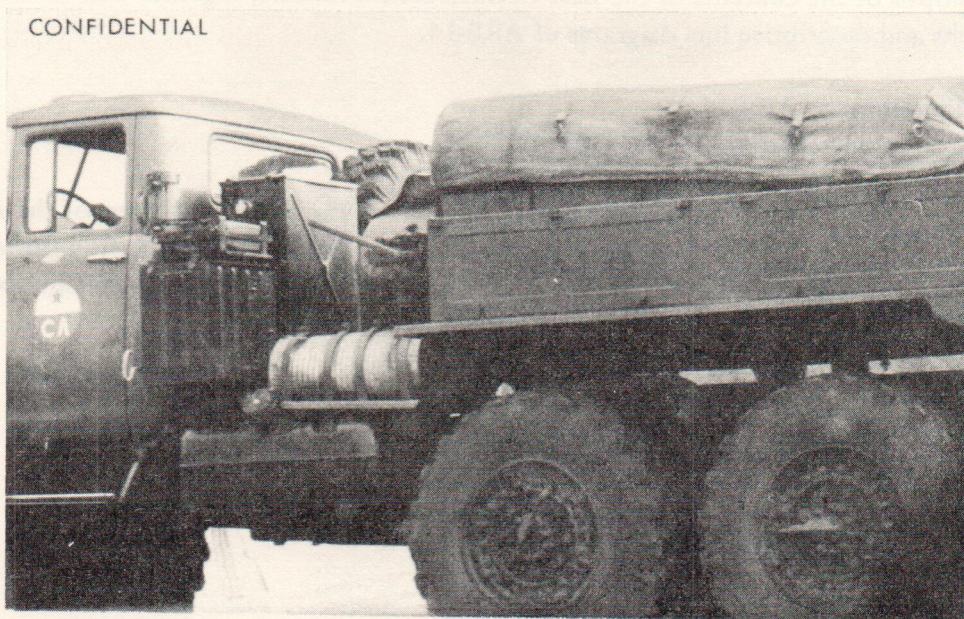


### Differences between ARS-14 and the ARS-12 models

Quite apart from the obvious differences in basic vehicle chassis, which greatly improve the cross country capability and operating characteristics of the ARS-14, there are a number of technical differences, albeit generally of a minor nature, which distinguish it from the two models of ARS-12.

The volume of the tank has been increased but, since the bowser carries additional deactivation and decontamination chemicals, this tank can only be filled up to 80% of its volume in order that the permitted loading of the basic vehicle is not exceeded. Thus the volume of decontaminant solution available is reduced by the quantity of solid or concentrated liquid decontaminant carried. Although the disadvantages of this are obvious, in that less decontaminant solution is available, it has the advantage of being a self-contained decontamination vehicle and does not require to be accompanied by a cargo vehicle carrying decontamination chemicals as did the ARS-12 models. Furthermore, the quantity of chemicals carried is sufficient for several full tanks of decontaminant solution.

Although the mechanical and hand drive pumps on the ARS-14 are the same as those on ARS-12 models, the position of the manual pump has been changed from left rear to left front of the bowser tank. (This can be seen clearly in Fig 2).



**Fig 2. Left hand side of ARS-14 showing the changed location for the manual pump forward of the bowser tank.**

The liquid level in the tank is shown on a remote liquid level indicator the design of which has changed from that on the ARS-12 models. The indicator consists of an electrical circuit with variable resistor, which is operated by a float in the tank, and an indicator gauge.

The eight outlet distributor of the ARS-12 models, which permitted simultaneous decontamination of eight separate equipments, is firmly mounted on the bowser chassis but in ARS-14 this has been replaced by a portable eight outlet distributor which is normally stowed in number 3 stowage bin at the front left of the bowser opposite number 1 bin. (Fig 3).



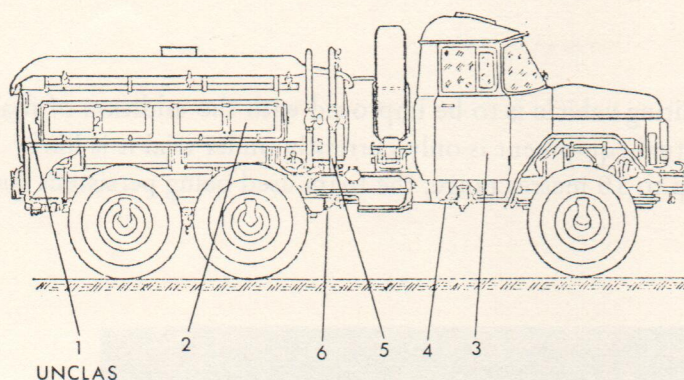


Fig. 3. Decontamination Bowser ARS-14 right hand view showing:

- (1) Tank
- (2) Stowage Bin No. 1
- (3) Driver's Compartment, ZIL-131
- (4) Motor for mechanical pump
- (5) Piping
- (6) Mechanical Pump

This saves time during decontamination if, for example, the pump is faulty and needs replacement, since it is no longer necessary to dismantle and reassemble the eight hoses as on the ARS-12 models. With ARS-14 it is only necessary to dismantle and reassemble the main outlet hose.

Also changed is the location of the eight hoses. Whilst in ARS-12 they are stowed in No. 2 bin at the right rear of the vehicle, in ARS-14 they are stowed in No. 4 bin at the left rear. In addition on ARS-14 they are wound in pairs on four reels rather than singly on eight reels as in ARS-12. The stowage arrangements for hose reels, hoses and distributors on ARS-14 also ease the deployment of the vehicle to either side of the road; with ARS-12 it was necessary to turn the vehicle for operation on the left hand side of the road.

A new item in the equipment of ARS-14 is a reinforced rubber heating hose which enables the vehicle to be used satisfactorily in conditions of intense cold. It is fitted onto the end of the vehicle exhaust and enables hot exhaust gases to be played onto frozen pumps, valves, pipes etc. A very simple device, it has a lot of advantages over flame heating, which cannot, in any case, always be used with safety, and hot water or steam are not always available.

In addition to the eight outlet distributor, hose reels and hoses, the stowage bins hold a three outlet distributor, a four outlet distributor, adaptors, spray nozzles without brushes, spray nozzles with brushes, jet pipes and wide jet nozzles designated DN-3. These last may be fitted both at front and rear of ARS-14 for ground decontamination whereas on the ARS-12 models they were fitted at the rear only. The new layout is shown in Fig. 4.

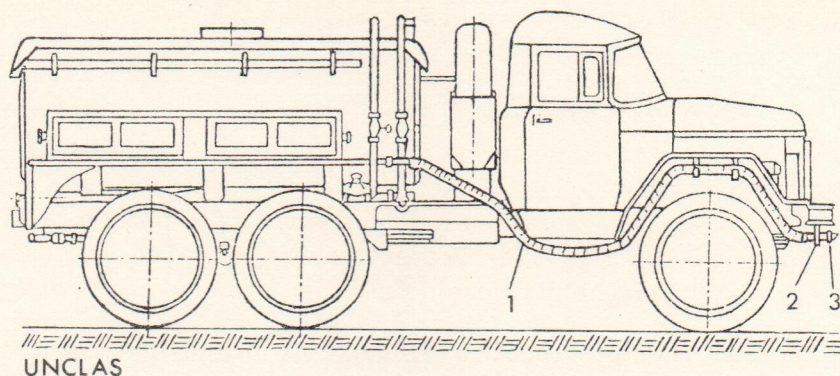


Fig 4. Line assembly for ground decontamination with forward layout of wide jet nozzle DN-3. ARS-14 in its ground decontamination role showing:

- (1) 50 mm diameter reinforced hose, (2) Angle bracket for fixing wide jet nozzle, (3) Wide jet nozzle DN-3.



### ARS-14 in its Fire Fighting Role

The effectiveness of ARS-14 as a fire fighting vehicle is to be improved with the addition of foam fire fighting equipment. Although the actual equipment is only currently under trial it is likely to be effective in extinguishing fires at up to 10 metres range, the foam used being persistent for 24 hours.



Fig 5. A brand new ARS-14. Right Side View.



## 7. Czech Tank Launched Scissors Bridge... MT-55 (SECRET AUSCANUKUS)

The T-55A mounted scissors bridge MT 55 first appeared in Czechoslovakia in 1968. There are two versions of this bridge, one with a solid web 18 m long (Fig. 1) and a rarely seen open web version which we assess as being 20 m long (Fig. 2). The main characteristics of the solid web version are given in the ATIR Engineer Digest of August 1971.

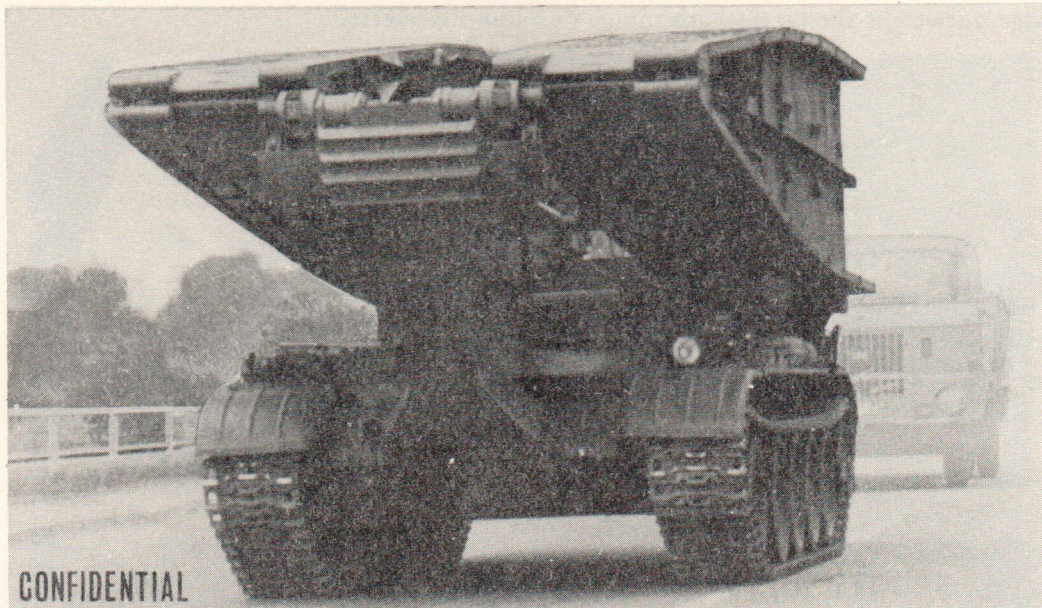


Fig 1. MT 55 with GSFG

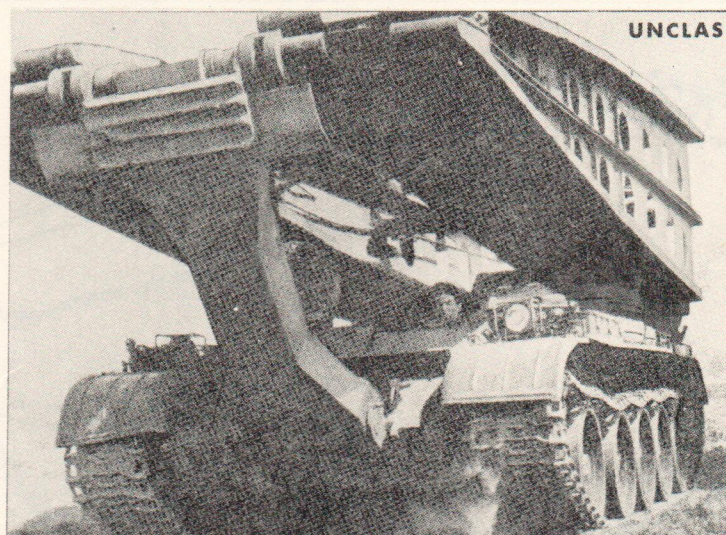


Fig 2. MT 55 (Long Version)

Since March 1972 the solid web version has been seen with GSFG but it is not known if it is on trial or on issue and whether it is intended to supplement or replace the MTU T-55.



Communist military writing indicates that there are two schools of thought regarding tank launched bridges. One school favours the cantilever system and the other the scissors type. Since World War II the Soviets have built cantilever launched bridges such as the MTU T-54 and the MTU T-55 while Czechoslovakia, East Germany and Yugoslavia have built scissors bridges. Both methods have their advantages and disadvantages. The cantilever system gives the tactical advantage of a low silhouette during launch, thus being less vulnerable to detection and destruction (Fig. 3). At the same time, unlike scissors bridges, cantilever launched bridges are not as effective when launched on uneven terrain or on steep uphill or downhill grades (Fig. 4). It may be that in trying out the MT 55 the Soviets have come to the conclusion that the greater versatility of the scissors type bridge outweighs the tactical advantage of a low silhouette.

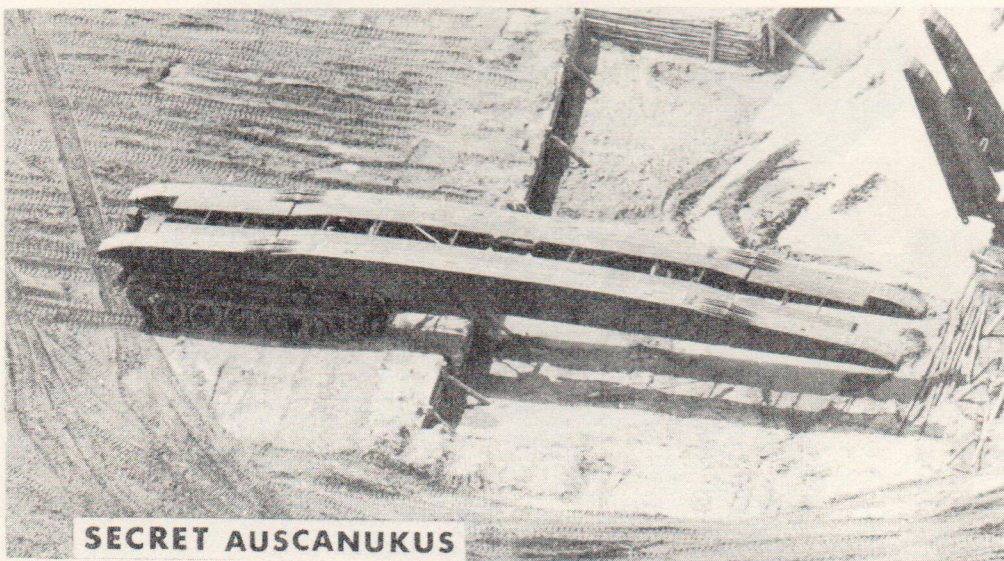


Fig 3. Cantilever Launch of MTU T-55

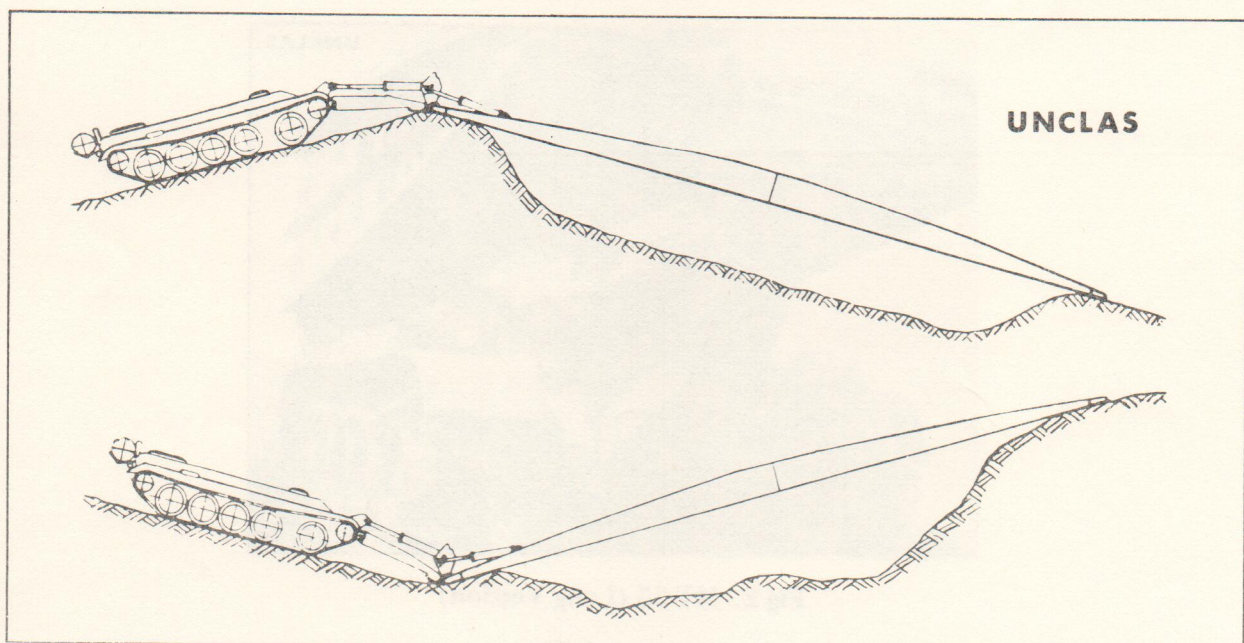


Fig 4. Various possibilities of laying bridge in uneven terrain





Fig 5. On suitable ground, the bridge can be lengthened by adding a second treadway section without interlocking.





Fig. 2. On suitable ground, the bridge can be fastened by adding a second  
heavy section without interfering.